

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) A turning angle detector comprising:
a magnetic flux generating means including a magnet for generating magnetic fluxes;
a magnetism sensing element responsive to the magnetic fluxes passing therethrough to detect a relative turning angle between the magnetic flux generating means and the magnetism sensing element from the magnetic fluxes passing therethrough; and
a magnetic flux reducing means for passing therethrough a part of the magnetic fluxes generated by the magnet thereby to reduce the magnetic fluxes passing through the magnetism sensing element only when the relative turning angle between the magnetic flux generating means and the magnetism sensing element is within a predetermined range of turning angles,
wherein at least one of said magnetic flux reducing means and said magnetic flux generating means is rotatable relative to the other of said magnetic flux reducing means and said magnetic flux generating means.
2. (Original) The turning angle detector as in claim 1, wherein the magnetic flux reducing means includes an external magnetic member made of magnetic material to pass the part of the magnetic fluxes therethrough.
3. (Original) The turning angle detector as in claim 2, wherein:
the magnetic flux generating means includes two generally semi-cylindrical yokes made of magnetic material and sandwiching the magnet between respective circumferential ends; and
the yokes have an inside shape of an ellipse.

4. (Original) The turning angle detector as in claim 2, wherein:
the magnet is divided into two generally semi-cylindrical magnet parts and magnetized in a radial direction; and
the magnetism sensing element is disposed between the magnet parts so that the magnetic fluxes pass from one of the magnet parts to the other of the magnet parts through the magnetism sensing element.
5. (Original) The turning angle detector as in claim 2, wherein the external magnetic member is provided radially outside the magnetic flux generating means.
6. (Original) The turning angle detector as in claim 2, wherein the external magnetic member is provided radially inside the magnetic flux generating means and axially displaced from the magnetism sensing element.
7. (Original) The turning angle detector as in claim 1, wherein:
the magnetism sensing element is positioned between two generally semi-columnar cores made of magnetic material; and
the magnetic flux reducing means includes a magnetic shortcut provided between the cores and nearer to the magnetic force generating means than to the magnetism sensing element, the magnetic shortcut being narrower than a radial thickness of the sensing element.
8. (Original) The turning angle detector as in claim 7, wherein:
the magnetic flux generating means includes two generally semi-cylindrical yokes made of magnetic material and sandwiching the magnet between respective circumferential ends; and
the yokes have an inside shape of an ellipse.

9. (Original) The turning angle detector as in claim 7, wherein:
the magnet is divided into two generally semi-cylindrical magnet parts and magnetized in a radial direction; and
the magnetism sensing element is disposed between the magnet parts so that the magnetic fluxes pass from one of the magnet parts to the other of the magnet parts through the magnetism sensing element.

10. (Original) The turning angle detector as in claim 7, wherein:
the cores have respective protrusions extending from flat surfaces to provide the shortcut, the flat faces of the cores facing each other; and
the protrusions are provided on circumferential ends of the cores thereby to narrow a gap between the cores at the circumferential ends.

11. (New) The turning angle detector as in claim 1, wherein:
the magnetic flux generating means is rotatably disposed and the magnetic flux reducing means is fixedly disposed at a predetermined position.

12. (New) The turning angle detector as in claim 11, wherein:
the magnetic flux generating means is attached to a rotating body and the magnetic flux reducing means is provided radially outside the rotating body.

13. (New) A turning angle detector comprising:
a magnetic flux generating means including a magnet for generating magnetic fluxes;
a magnetism sensing element responsive to the magnetic fluxes passing therethrough to detect a relative turning angle between the magnetic flux generating means and the magnetism sensing element from the magnetic fluxes passing therethrough; and

a magnetic flux reducing means for passing therethrough a part of the magnetic fluxes generated by the magnet thereby to reduce the magnetic fluxes passing through the magnetism sensing element only when the relative turning angle between the magnetic flux generating means and the magnetism sensing element is within a predetermined range of turning angles,

wherein the magnetic flux reducing means includes an external magnetic member made of magnetic material to pass the part of the magnetic fluxes therethrough,

wherein the magnetic flux generating means includes two generally semi-cylindrical yokes made of magnetic material and sandwiching the magnet between respective circumferential ends; and

wherein the yokes have an inside shape of an ellipse.

14. (New) A turning angle detector comprising:

a magnetic flux generating means including a magnet for generating magnetic fluxes;

a magnetism sensing element responsive to the magnetic fluxes passing therethrough to detect a relative turning angle between the magnetic flux generating means and the magnetism sensing element from the magnetic fluxes passing therethrough; and

a magnetic flux reducing means for passing therethrough a part of the magnetic fluxes generated by the magnet thereby to reduce the magnetic fluxes passing through the magnetism sensing element only when the relative turning angle between the magnetic flux generating means and the magnetism sensing element is within a predetermined range of turning angles, wherein

the magnetism sensing element is positioned between two generally semi-columnar cores made of magnetic material; and

the magnetic flux reducing means includes a magnetic shortcut provided between the cores and nearer to the magnetic force generating means than to the

magnetism sensing element, the magnetic shortcut being narrower than a radial thickness of the sensing element.

15. (New) The turning angle detector as in claim 14, wherein:
the magnetic flux generating means includes two generally semi-cylindrical yokes made of magnetic material and sandwiching the magnet between respective circumferential ends; and
the yokes have an inside shape of an ellipse.

16. (New) The turning angle detector as in claim 14, wherein:
the magnet is divided into two generally semi-cylindrical magnet parts and magnetized in a radial direction; and
the magnetism sensing element is disposed between the magnet parts so that the magnetic fluxes pass from one of the magnet parts to the other of the magnet parts through the magnetism sensing element.

17. (New) The turning angle detector as in claim 14, wherein:
the cores have respective protrusions extending from flat surfaces to provide the shortcut, the flat faces of the cores facing each other; and
the protrusions are provided on circumferential ends of the cores thereby to narrow a gap between the cores at the circumferential ends.

18. (New) A turning angle detector comprising:
a magnetic flux generator including a magnet for generating magnetic fluxes;
a magnetism sensing element responsive to the magnetic fluxes passing therethrough to detect a relative turning angle between the magnetic flux generator and the magnetism sensing element from the magnetic fluxes passing therethrough;
and

a magnetic flux reducer for passing therethrough a part of the magnetic fluxes generated by the magnet thereby to reduce the magnetic fluxes passing through the magnetism sensing element only when the relative turning angle between the magnetic flux generator and the magnetism sensing element is within a predetermined range of turning angles,

wherein at least one of said magnetic flux reducer and said magnetic flux generator is rotatable relative to the other of said magnetic flux reducer and said magnetic flux generator.

19. (New) The turning angle detector as in claim 18, wherein the magnetic flux reducer includes an external magnetic member made of magnetic material to pass the part of the magnetic fluxes therethrough.

20. (New) The turning angle detector as in claim 19, wherein the magnet is divided into two generally semi-cylindrical magnet parts and magnetized in a radial direction; and

the magnetism sensing element is disposed between the magnet parts so that the magnetic fluxes pass from one of the magnet parts to the other of the magnet parts through the magnetism sensing element.